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CATALOGUE

OF

THE HUNTERIAN COLLECTION

IN

THE MUSEUM

OF

THE ROYAL COLLEGE OF SURGEONS IN LONDON.

PART II.

COMPREHENDING

THE PATHOLOGICAL PREPARATIONS IN A DRIED STATE.

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CATALOGUE.

ILLUSTRATIONS OF THE ACTIONS OF RESTORATION AND OF DISEASE.

Series I. Fractures of Bone.

1. *Fissures of the Skull.*

No.
1. A SKULL* in which there are several fissures which had been of considerable standing; for although they were not united, yet the sharp edges were rounded off by being absorbed. They seem to have had little regard to sutures; running across and alongside of them. The principal fissure extends from the fore part of the head to near the back, passing from the os frontis through the parietal bone contiguous to the sagittal suture, which is nearly obliterated. There are several other fissures in the right and left parietal, and occipital bones.
2. A calvaria fractured with depression. [The fracture is in the situation of the junction of the coronal and sagittal sutures, and extends a little way in the direction of the latter, but has wandered into the right parietal bone, the sagittal suture being almost wholly obliterated. The skull has been trephined in two places, in the line of the coronal suture; in one of which the depression appears to have existed.]

* To avoid repetition, all the specimens are presumed to be human that are not otherwise expressed.

2. *Fractures united.*

3. A section of a skull, showing the ossa nasi united with some displacement, after fracture.
4. A rib [the second, of the right side,] which has been fractured transversely, and united.
5. A lower or false rib, united after a fracture.
6. A similar specimen.
7. A rib of a quadruped, [apparently an ox,] which has been extensively fractured, and is united by firm bony union.
8. A similar specimen. [The rib has been fractured transversely, and united by a more luxuriant bony deposit.]
9. A similar specimen. [Apparently from a hog.]
10. Part of the left scapula of an ostrich, which has been fractured and united.
11. The first rib, from the left side of an ostrich, which has been fractured and united.
12. The second rib, from the left side of an ostrich, showing the same circumstance.
13. The third rib, from the left side of an ostrich, similarly circumstanced.
14. The seventh rib, from the left side of an ostrich, which had been fractured and united.
15. The eighth rib, from the right side of an ostrich, in a similar state.
16. The cartilage of a false rib, [apparently from a horse,] which has been fractured in several places, and united by bony union. The cartilage itself has become ossified.
17. A clavicle, from the right side, united after fracture near its middle.
18. A clavicle, from the right side, united after fracture; but with greater displacement of the broken extremities.
19. A clavicle, from the left side, whose outer extremity is considerably depressed in consequence of fracture. The broken extremities have been united at some distance from each other.
20. The bones composing the left shoulder-joint. [There has, apparently, been a fracture of the greater tubercle of the head of the humerus; and the portion displaced has been united, at some distance from its natural situation, by bony deposit.]

21. A humerus, in which there has been a fracture of the neck, with flattening and displacement of the head.
22. A humerus, having a similar fracture and displacement of the upper part; and another fracture below its middle.
23. A humerus, the head of which has been depressed, in consequence of a fracture at, and below, the neck of the bone.
24. A humerus, which appears to have been fractured at its neck. A bony process projects from the united part.
25. A humerus, which had been fractured near its middle, united.
26. A similar specimen, in which a large splinter has been detached and displaced, but now firmly united, apparently with its medullary canal outwards.
27. A humerus, which had been fractured near its lower extremity. The broken ends have been very well set, and firmly united, most probably in consequence of the fracture being very simple.
28. An os humeri which had been fractured in two places near the elbow, either at the same, or at different times. The three portions of the bone take different directions, but are firmly united, and with little deformity.

    [In Nos. 27 and 28 a depression, denoting the former situation of the medullary cavity, is apparent in the anterior part of the lower portion of each bone.]
29. A radius, which had been fractured near its middle, united.
30. A similar specimen.
31. The bones of a fore-arm, in which the radius has been fractured near the wrist; where, as is usual in such cases, it has caused distortion.
32. The os humeri of a turkey, which has been much splintered; but is united, with great deformity.
33. The os humeri of a turkey, which has been fractured. The broken extremities of the bone were about an inch distant from each other, probably in consequence of the drooping of the wing. They are now firmly united by a dense extended callus.
34. An os humeri of a bird, [apparently the domestic fowl,] which has been fractured, and is united in much the same manner as the preceding specimen, but with greater contraction or shortening.
35. The pelvis of a [quadruped, apparently a fallow deer,] which has been

severely fractured in several parts, and partially united by granulations of bone, with some distortion.

36. A femur, fractured near its upper extremity, which has been united better than is commonly the case in fractures of this part. [That considerable injury had been sustained by the parts within the capsular ligament, is evident from the state of the head of the bone, which is somewhat depressed. Ossific matter has been deposited on the superior part of the neck, which coming in contact with the brim of the acetabulum, in some measure compensated for the depressed state of the head of the bone.]

37. A femur, in which there have been two fractures; one at its upper extremity, where the head, neck, and both trochanters have been detached, and driven downwards behind the body or shaft of the bone, and are firmly united to the part occupied by the linea aspera. The other fracture has taken place near the middle of the femur, in which there is a remarkable singularity: viz. a large splinter has been detached from all the surrounding parts, and turned so far round as to throw its external surface towards the medullary canal, and cause its internal reticular surface to present towards the muscles. All the parts are firmly united.

38. A femur, in which a great part of the shaft of the bone has been broken into huge splinters; all of which are very firmly united together, but with considerable distortion. [The lower portions are situate behind the upper.]

39. A femur which has been fractured near its middle. The broken extremities overlap each other, but are very firmly united, though with much deformity. [The lower portion is also situated behind the upper, as in the preceding specimen.]

40. A femur, the shaft of which is small and dense, and has a greater curve than is usual. [It has been fractured, and united with the lower part drawn up in front of the upper portion of the bone.]

41. A femur, which had been fractured near its middle, and the extremities had ridden considerably over each other. The axes of the two portions not being in the same line, one end of the bone is, of course, not so smoothly united as the other. [In this specimen the lower portion is situate behind the upper.]

42. A transverse section of a fractured femur. The broken ends having united laterally, the medullary canal, in consequence, is not filled up by the callus at the point of union.
43. A portion of tibia, showing a fracture near its middle, which has been firmly united without much distortion.
44. A tibia and fibula which have been fractured; the tibia near the lower, the fibula near the upper extremity, as is generally the case. The fractures have been well united.
45. A similar specimen. [Both the tibia and fibula have been splintered, but the splinters are firmly united; and must, from their position, have afforded considerable support to the limb, during its progress towards recovery.]
46. Two longitudinal sections of a tibia which had suffered a compound fracture near its lower extremity. [No. 66 Pathological Preparation in Spirit, is a section removed from between these two portions: and it is there stated that "the sore never healed, nor could the man bear any weight on the limb, in consequence of the two portions of the bone having united by so small a surface. The leg was amputated on that account."]
47. A fibula, with an unusually oblique or extended fracture, towards its upper extremity.
48. A femur of a quadruped, [apparently a sheep,] which has been fractured, and its union attended with extensive deposition of interposed and surrounding bony matter.
49. A section of the thigh-bone of a fowl, which has been fractured; showing the obliteration of the medullary canal at the united part, and extensive interposed bony matter.
50. Two femora of birds, which have been fractured, and united with great reduction of their length; and in one instance, with much deformity.

    [It may be remarked, that the bones of birds are almost always united by a luxuriant callus; and the reason is obviously on account of the greater activity or restlessness of this class, when compared with quadrupeds.]
51. Two tibiæ of birds, that have been fractured; but are united with much less deformity than the preceding specimens.
52. A portion of the horn of a fallow (?) deer, in which a fracture of one of the antlers had occurred during its growing state, but has been firmly united.

53. A horn of a fallow-deer, in which the beam has apparently been fractured and united; but the injury has occasioned a diminutive and deformed growth.

54. A single valve of the shell of a fresh-water muscle [Anodon anatinus], in which a fracture has been repaired by a deposit of nacre on its inside.

3. *Fractures ununited.*

55. A portion of a fractured rib, where the extravasated blood between the broken surfaces had died, and was absorbed. The adhesive inflammation in the surrounding parts was forming the union.

56. A scapula with a fracture, or a partial division, near its spine. The effects of the ossific inflammation are observable on the divided edges.

57. The scapula of a lion, fractured transversely; in which the ossific inflammation had begun.

58. An ulna, fractured near its middle, and not united; the fractured ends forming an artificial joint. [A section of the bone has been made, which shows that the medullary canal is obliterated at this part, in consequence of the deposit of ossific matter.]

59. A femur, fractured near its upper extremity; in which the process of union had begun to take place.

60. A femur, fractured obliquely below the great trochanter. A part of the lower portion had become dead, and was in progress for exfoliation; and around this part an abscess formed, which has been circumscribed by luxuriant bony deposit.

61. A tibia, fractured at its upper extremity; with fissures which communicated with the knee-joint. The fibula remains unbroken.

62. A tibia, fractured towards its lower end: the fibula is, as usual, fractured near its upper extremity.

63. A tibia and fibula, with simple fracture near their middle. "The surfaces of contact of the two broken bones had become smooth, fitting them for motion: this probably arose in some measure from want of attention in keeping the bones at rest, for they are placed nearly at right angles; which shows the want [or absence] of chirurgical assistance." [The fibula, which had evidently been in the same condition that the tibia still

retains, had become united, and served the purpose of a splint to the tibia, in which some slight efforts towards union had begun to take place.]

64. A portion of a tibia, which has been fractured near its middle, and has re-united by a small surface, apparently under circumstances similar to the preceding specimen.

65. A section of a tibia from a case of compound fracture; in which ossification has taken place in the surrounding periosteum.

66. The humerus of a small quadruped, [about the size of a hare,] which had been fractured. Although much bony matter has been deposited on the broken ends, union has not taken place; probably in consequence of the frequent motion of the parts on each other.

67. The humerus of a bird, [apparently a vulture,] under somewhat similar circumstances.

68. The right humerus of an ostrich, which having been fractured, and union not taking place, an imperfect joint has been formed. [A very large deposit of ossific matter has taken place on the broken ends of the bone, for the purpose of union; but the intention has been frustrated, without doubt, by the frequent motion of the parts.]

69. A human patella, which has been fractured transversely, near its middle, and united by ligament.

70. The right femur and tibia of the Great Speckled Diver, or Loon of Pennant, showing a remarkably long process from the head of the tibia, answering the purpose of a patella, and affording a great extent of origin to the flexor muscles of the tarsus. [This preparation is retained here, although it does not exhibit any morbid alteration of structure, because it was used by Mr. Hunter as an illustration in his lecture on fractured patella and olecranon.]

71. An apparatus of steel springs attached to a femur and tibia, to explain how muscles adapt themselves to the shortest distances, where ligamentous union has taken place, in cases of fractured patella.

72. An analogous apparatus applied to a humerus and ulna, to demonstrate the same circumstances in fractures of the olecranon.

Series II. Ossific Inflammation.

1. *Inflammation of the Surface of Bone.*

73. A portion of the left femur of a young subject, which had been fractured below its middle: considerable inflammation had attacked the bone and surrounding parts beyond the fracture; and had continued so long as to have produced ossification in the periosteum, which is easily distinguishable from the original bone. The bone is divided longitudinally.
74. A right femur, showing the effects of inflammation on its surface: viz. traces of excessive vascular action, and ossification of the periosteum.
75. The left femur of the same individual, in a similar state.
76. A tibia, the periosteum of which has been affected by ossific inflammation, producing appearances on the surface similar to those of the preceding specimen.
77. A tibia, along the posterior surface of which is a crust of newly formed bone, arising from inflammation of the periosteum. On the anterior part it appears to have been affected by superficial ulceration.
78. The lower part of a tibia, whose surface exhibits traces of inflammation, viz. ossification, and enlargement of the vessels, of the periosteum.
79. The pelvis of a lion, which had been considerably affected by ossific inflammation; the original bone being in many parts entirely covered by the additional or newly formed bone.
80. A longitudinal section of the left femur of the same animal, in a similar state.
81. A longitudinal section of the right femur of the same animal, in a similar state. [This femur had been steeped in an acid, in order to make the section without injury to the delicate texture of the newly formed bone. No. 193 Pathological Preparation in Spirit is the counterpart of this specimen.]
82. A patella, from the same animal, in a similar state.
83. The left tibia of the same animal, in a similar state.
84. The right tibia and fibula of the same animal, similarly affected.
85. The right os calcis of the same animal, in a similar state.
86. The left os calcis of the same animal.

87. Part of the left scapula of a very large lion. The acromion is greatly increased in size by additional ossific matter, in consequence of inflammation.
88. The left ulna of the same lion, in a similar state.
89. The right ulna of the same lion, thickened by deposition of bone on its surface, from superficial inflammation.
90. The right femur of the same lion, remarkably enlarged in consequence of inflammation. The newly formed bone is most luxuriant at the posterior part, where it has somewhat of a laminated appearance.
91. A human (?) patella, from the surface of which, bony spicula extend in the direction of the fibres of the ligamentum patellæ.
92. A patella of a quadruped, [apparently a lion,] which has been affected in a similar manner.
93. Tarsal bones of a lion, from which newly formed bone has shot out into processes which might have produced anchylosis by means of the surrounding parts. Also one of the caudal vertebræ in a similar state.
94. Some phalanges of the toes of a very large seal, affected by ossific inflammation.
95. The coffin-bone, or last phalanx of the foot of a horse; where, in consequence of repeated inflammations, greasy heels, &c., the ossific inflammation had caused considerable extension of its quarters.
96. A portion of ossific matter, from the foot of a horse; deposited in consequence of ossific inflammation.

2. *Swelling of Bone, from Inflammation of the Substance.*

a. *Of the Skull.*

97. A section of a calvaria, with unusual thickening of the parietal bones. The sutures, even the frontal, are very distinct externally, but on the internal surface there is scarcely a trace of their existence remaining. [It is heavy, and dense in structure, which seems to be more like the effect of simple inflammation than scrofulous thickening.]
98. A vertical section of the calvaria [said to be] of a young person, which is considerably thickened in its substance, especially in the centres of the bones; most probably arising from a scrofulous disposition.

99. Part of a skull, of which the os frontis is very dense and much thickened; with irregular depressions and bony protuberances internally.
100. A calvaria, where inflammation has caused an almost entire obliteration of the sutures. [It is very much thickened in some parts, viz. at the frontal and parietal protuberances, and thin in others: it has also a singular os triquetrum in the sagittal suture.]
101. A vertical section of the calvaria of an adult. The parietal bone is much thickened near its centre: the os frontis is remarkably so. [This skull must have been of unusually small dimensions. There is no trace remaining of the coronal suture.]
102. A portion of an os frontis, and a portion of bone removed by the crown of a trepan, from skulls of considerable thickness. [They are apparently from different individuals, and are not so remarkable as some of the preceding.]
103. A vertical section of a skull with thickened parietes, especially the os frontis.
104. A calvaria, wherein the sutures are obliterated, and the parietes thickened and inclining to a spongy texture. The outer surface has a remarkable porous aspect, and the inner one is universally grooved and furrowed by vascular action.
105. A similar specimen, but affected in a still greater degree.
106. An adult skull, of an extraordinary friable and spongy texture; and measuring, in almost every part, an inch and a quarter in thickness. It was found in digging a grave in Stepney churchyard, and was presented to Mr. Hunter by Mr. Patten, Surgeon, of Ratcliff-cross. [The impressions of the blood-vessels on its inner surface are worthy of remark, on account of their great depth.]

b. *Of Cylindrical Bones.*

107. The lower end of an os humeri, much thickened in consequence of inflammation.
108. A femur, to show swelling of its substance. On its surface may be observed the impressions of blood-vessels.
109. A similar specimen.
110. A femur, thickened towards its lower extremity, from inflammation.

111. The lower part of a femur, much thickened, and having impressions of blood-vessels on its surface, similar to the preceding specimens.
112. A femur considerably thickened at its lower end. It is much curved, and convex anteriorly.
113. A femur, the lower part of which has been in an inflamed state, and is partially thickened and incrusted by ossific matter.
114. The lower end of a femur, very considerably thickened by the deposition of bony matter on its surface. [The section shows the proportion of the bony addition.]
115. A tibia thickened by ossific inflammation. [This specimen is somewhat curved, and is remarkably heavy.]
116. A right tibia, which is thickened; and appears, from the numerous perforations of blood-vessels, to have been in a state of high inflammation.
117. The left tibia, from the same individual, similarly diseased.
118. A tibia thickened at its middle; with a very irregular surface.
119. A portion of a tibia considerably thickened; with cribriform perforations by the superficial blood-vessels.
120. A tibia and fibula in a similar state.
121. A tibia and fibula similarly diseased, but in a greater degree.
122. A fibula thickened towards its lower part.
123. A fibula thickened, and the surface next the tibia very irregular.
124. A similar specimen, but with a greater degree of thickening.
125. A fibula, which is thickened towards its middle, in consequence of the ossific inflammation.
126. A fibula thickened; and with an extremely irregular surface.
127. The right humerus of a young ostrich, thickened and distorted.
128. The left humerus of the same bird, affected in a greater degree.
129. The right humerus of a young ostrich, similarly affected, but in a still greater degree.
130. Two of the carpal bones of a large bird, [probably an eagle,] in a similar state.
131. A young branch of a fir, which from accidental injury is under circumstances similar to thickening of bone in consequence of inflammation.

Series III. Ulceration of Bone.

1. *Absorption and Ulceration of Bone from Pressure.*

132. The skull of an aged person, to show that the alveolar processes have been completely absorbed after the loss of all the teeth.

133. The anterior portion of the lower jaw of a boar, in which the tusks had attained an unusual length, in consequence of their not having been properly opposed by the tusks in the upper jaw, and therefore not worn away as usual by attrition; and consequently have turned inwards, and pierced the jaw on each side, and passing obliquely forwards, re-entered the mouth, after having completed nearly a gyration and a half.

134. The inter-maxillary bones of a rabbit (?), in which the left incisor has attained an unusual length, from the same cause as the preceding specimen; and has penetrated into, or formed a groove in the inter maxillary bone of the opposite side.

135. A portion of the cranium of a giddy sheep, in which absorption of the bone, in several places, has been produced by pressure from hydatids in the cerebrum.

136. The first bone of a sternum, ulcerated in consequence of the pressure of an aneurism.

137. The second bone of the sternum, ulcerated from the same cause.

138. A clavicle much ulcerated: [probably from the same cause.]

139. An os ilium, ulcerated in consequence of the pressure of matter from a lumbar abscess.

140. The upper part of a femur, ulcerated: [apparently from the same cause, and probably from the same individual as the preceding specimen.]

141. The upper extremity of a femur, to show the effects of pressure [probably from abscess,] which had produced absorption of its surface. The medullary cavity is much diminished, in consequence of the thickening of the parietes of the bone.

142. A femur, to show that absorption has taken place towards its lower extremity: [probably in consequence of abscess, or of aneurism; but not to any great extent.]

143. The lower part of a femur and upper part of the tibia, of the right side, showing absorption of the bones from the pressure of a poplitæal aneurism.

144. The lower portion of the left femur of a man, the posterior surface of which has been absorbed in consequence of the pressure of a poplitæal aneurism. On the circumference of the part pressed upon, ossific matter has been thrown out from the periosteum. [See Pathological Preparation No. 369 Dry, for the continuation of the history of this specimen. The patient died from mortification of the foot.]

145. The lower part of a femur, ulcerated, from the same cause; and, from its lightness, appears to have had much of its earthy matter absorbed.

146. The lower portion of a femur, with an excavation, about two inches in diameter, at its posterior part, in consequence of the pressure of a poplitæal aneurism.

2. *Ulceration in consequence of Disease in the Bone.*

147. A portion of the skull of a French printer, where the bone was absorbed in many places in consequence of the formation of scrofulous tumours on both the external and internal surfaces, and in its substance. [See No. 610 Pathological Preparation in Spirit, which is from the same individual.]

148. An apparently female skull, from which a vertical section has been removed, showing the progress of a similar form of disease to a very advanced state; having destroyed the greater part of the squamous portion of the left temporal bone, and the adjoining parts of the sphænoid and parietal bones. A section of the right parietal and occipital bones has been made, to show two small cavities on the inside, formed by ulceration acting from within outwards.

149. A calvaria, very extensively ulcerated on its internal surface; and in which the diplöe has been almost entirely removed. [A large circular portion of the inner table has been destroyed, leaving only a thin film of the outer table, but there is scarcely any appearance of disease on the external surface of the skull. Whether the affection were considered venereal or not, there is no record. It has every appearance of the absorption having been produced by pressure from within.]

150. The calvaria of a gentleman, to show ulceration from pressure arising from disease in the bone. The disease appears to have originated on the inside, and in several places it has extended through both tables, to the external surface of the skull. "On opening the body many other bones were found in the same condition; where, in place of the bone that was removed, there was found a curdy substance."

151. A portion of rib from the same individual, ulcerated from the same cause. The ulceration had begun in the centre, and made its progress through the two sides; in one of which it has left a large opening.

152. The lower part of the humerus of the same individual, which was so far destroyed by ulceration as to break, just before death, by the motion of the arm. There being no disposition for the ossific process on the outside, was the cause of the bone giving way.

153. The upper portion of the right femur of a dignitary of the Church, which broke while turning in bed, of which he soon died; and on examination there was found a curdy matter with recently extravasated blood. Ulceration had begun in the centre of the bone, and continued until it was only a thin shell, and in some places it had gone quite through. There was very little disposition for the ossific process on the outside.

154. A section of the humerus of an ox, which contained in its medullary cavity an incysted, glossy, hydatid-like tumour. [No. 527 Pathological Preparation in Spirit is the counterpart of this bone, containing the cyst.]

3. *Ulceration on the Surface of Bone.*

155. A skull, on the surface of which are several superficial ulcerations. The bones are of considerable density, with scarcely any appearance of diplöe.

156. A calvaria, ulcerated in circular spots. The ulceration has in one part penetrated through both tables, leaving an aperture much resembling that produced by the crown of a trephine, but smaller.

157. A tibia, to show absorption of its surface in consequence of ulceration; accompanied by inflammation and ossification of the periosteum.

4. *Ulceration in the Substance of Bone.*

158. A natural skeleton of the trunk of a child, showing ulceration of the bodies

of three dorsal vertebræ [with a slight degree of curvature forwards, in consequence].

159. A natural skeleton of the trunk of an adult female with a distorted spine, in consequence of disease in some of the lower dorsal vertebræ. The bodies of the last four dorsal and first lumbar vertebræ are destroyed.

160. Three lumbar vertebræ, ulcerated.

161. The lumbar vertebræ and sacrum of a young subject, ulcerated.

162. The last two lumbar vertebræ, and the upper part of the sacrum, ulcerated.

163. A similar specimen.

164. The last two lumbar vertebræ and sacrum of a young person. Ulceration has extended deeply into the substance of the latter bone.

165. The substance of the ulna and radius ulcerated.

166. The head of a tibia, in which a considerable part of its substance has been destroyed by ulceration. The joint of the knee has participated in the disease.

167. A very similar specimen, in which a great part of the substance of the bone has been removed by ulceration, leaving a thin and very light external shell. [The disease has attacked the head or stump of the tibia after amputation.]

168. A portion of a tibia, at the lower part of which are several sinuses, some of which communicated with the joint. [Probably the effects of gun-shot.]

169. A portion of a tibia, the lower extremity of which has been entirely destroyed.

170. A tibia and fibula, which exhibit a variety of diseases incident to bone: viz. ulceration destroying the original bone, by which means a considerable part of the fibula has been removed; and ossific inflammation forming new bone which has produced anchylosis between the tibia and fibula. These effects were produced by the extravasation of blood in this part.

171. A fibula thickened and ulcerated near its middle.

5. *Abscess in Bone.*

Spina ventosa.

172. The lower extremity of a femur, distorted and enlarged into a considerable cavity: [probably in consequence of abscess.]

173. The head of a tibia, [apparently from the same limb,] in a similar state.

174. The lower part of a femur and upper part of the tibia. In the centre of the head of the tibia an abscess had formed. While ulceration was enlarging the cavity within, ossific matter was being deposited on the outside; in consequence of which the circumference of the bone became of considerable size; ulceration, however, had made an opening through the bone for the exit of the matter.

175. The upper portion of a tibia, enlarged, and excavated by a considerable abscess in its substance.

176. The upper portion of a tibia, which is much enlarged in consequence of inflammation, and probably abscess.

177. A metatarsal bone of a sheep (?), in which was an abscess, the parietes of which are distended or enlarged by the deposit of ossific matter externally, in proportion to the increase of the cavity within; forming what is usually termed a Spina ventosa.

178. A metatarsal bone of a sheep, the cavity of which has been enlarged, and a considerable part of the substance destroyed by ulceration and abscess, apparently in consequence of fracture, or necrosis, or both.

179. The right side of the lower jaw of a sheep, the anterior part of which is dilated into a bony cyst as large as the egg of a goose. [Its parietes are very thin, and without doubt contained fluid; probably hydatids.]

180. The lower jaw of a small quadruped, [apparently a Virginian opossum,] the anterior half of the left side of which is occupied by a hollow sponge-like bony tumour, induced by a diseased state of the teeth.

Series IV. Diseases of Joints.

Ulceration of the Articular extremities of Bones.

181. A scapula and clavicle, showing disease of the joint between the latter bone and the acromion. The clavicle of the opposite side is also preserved, showing a similar disease of its outer extremity. [Probably an arthritic affection.]

182. A scapula, the glenoid cavity of which is ulcerated and altered in form.

183. A diseased shoulder-joint, [in which the articulating surfaces of the scapula and humerus have been absorbed.]

184. A diseased shoulder-joint, [in which the glenoid cavity of the scapula and the head of the humerus have entirely lost their natural form, in consequence of ulceration; and the motion of the joint had been very much limited in consequence of bony deposit.]

185. A humerus, the head of which is much reduced by ulceration.

186. The bones composing the elbow-joint, greatly enlarged in consequence of ossific deposit; and ulcerated, but without having entirely destroyed the articulating surfaces. The lower extremities of the radius and ulna are similarly affected. [Like No. 181, the disease seems to partake more of the arthritic than the strumous character.]

187. The bones composing the elbow-joint, from which the articular surfaces have been entirely removed by ulceration.

188. The bones composing the elbow-joint, of which the articulating surfaces have been destroyed by ulceration.

189. The bones composing the elbow-joint, the articulating surfaces of which have been considerably eroded by ulceration.

190. The bones composing the elbow-joint of a young subject, considerably affected by ulceration, [probably of the scrofulous kind.]

191. An ulna, the upper articulating surface of which is much indented, and rendered irregular by the ulcerative process.

192. Part of an ulna which is ulcerated at the elbow-joint, [subsequent to fracture of the olecranon, which is partially united.]

193. An ulna, enlarged and ulcerated at the elbow-joint.

194. A radius, whose upper extremity is much diminished and distorted, in consequence of accident or disease at the elbow. [Probably, but not certainly, from the same limb as the preceding specimen.]

195. A radius, ulcerated on its lower articulating surface, and its extremity considerably enlarged by ossific deposit.

196. An os innominatum, in which the acetabulum is greatly enlarged, or extended, by the formation of a bony case surrounding its margin, in consequence of disease in the joint.

197. The bones composing the hip-joint, which have been affected in the follow-

ing manner:—The acetabulum has been the seat of ulceration, which has enlarged its cavity, destroyed part of its circumference, and opened a passage through its centre into the pelvis. The neck of the femur has been shortened; ossific matter has been deposited and accumulated upon it, to give support to the ilium as the head sank deeper into the articular cavity; and a small process of dense bone has arisen from the lower part of the neck of the femur, and passing into the obturator foramen, supports, like a hook or crutch, the margin of the acetabulum.

198. A hip-joint, in which the acetabulum is greatly enlarged in consequence of ulceration; and the head of the femur diminished in size from the same cause. There had also been psoas abscess, which has affected the inner surface of the os ilium.

199. A hip-joint, in which an abscess had formed, in consequence of which the acetabulum is enlarged, and the head of the femur diminished, as in the preceding specimen. [The abscess had extended within the pelvis beneath the iliacus internus muscle, or else from that situation had communicated with the joint, and become the cause of the disease in that part.]

200. A hip-joint, from a young subject, in which the acetabulum is ulcerated, and has ossific growths projecting into its cavity. The head of the femur is almost entirely destroyed by ulceration.

201. A hip-joint, in which the acetabulum is widened, and its margin destroyed by ulceration. The cartilaginous surface of the head of the femur has also been destroyed by ulceration.

202. A hip-joint, in which considerable progress had been made towards anchylosis, in consequence of bony deposit in the cavity of the acetabulum, and on the head and neck of the femur.

203. The upper portion of a femur, showing alteration in the form of the head and neck, in consequence of disease in the hip-joint.

204. The upper portion of a femur, whose head is much flattened in consequence of disease in the hip-joint.

205. A similar specimen, but the alteration in form still more remarkable.

206. The upper portion of a femur, the head and neck of which are greatly attenuated, in consequence of disease in the hip-joint; and part of the great trochanter is destroyed by ulceration.

207. The condyles of a femur, ulcerated, and much altered in form, in consequence of disease in the knee-joint.

208. The lower extremity of a femur, showing the effects of ulceration on one of the condyles.

209. The extremities of the femur and tibia composing the knee-joint, which have undergone considerable change of form in consequence of ulceration.

210. The lower extremity of a femur, and upper part of a tibia, whose articulating surfaces have been destroyed by ulceration.

211. A knee-joint, in which a still more remarkable change had taken place in the articulating surfaces of the femur, patella, and tibia, in consequence of abrasion. [It is probable that the bones had been previously dislocated.]

212. Two patellæ, whose articulating surfaces have been destroyed by ulceration.

213. The head of a tibia, whose articulating surfaces have been destroyed by ulceration.

214. A very similar specimen. The ulceration has extended deeply into the substance of the bone.

215. The head of a tibia separated from the shaft by ulceration, which has extended into, or originated from, the joint. [Probably a scrofulous affection.]

216. The lower extremity of a tibia, whose articulating surface has been destroyed by ulceration in the ankle-joint.

217. The upper part of a fibula, in a state of inflammation and ulceration.

218. A fibula, the lower extremity of which appears to have been involved in an abscess.

219. An astragalus, slightly affected by ulceration.

220. A calcaneum, much enlarged, and its substance furrowed and perforated, by the processes of inflammation and ulceration.

Series V. Ossific Granulation.

1. *Granulations from the Skull.*

221. A calvaria, which has been very extensively fractured; the fissure extending from the right parietal bone to the left, across the centre of the os frontis.

The trephine had been applied on both sides of the skull. The patient appears to have survived the injury many years. There are appearances of ossific granulations externally, in the line of the fracture, which have produced almost complete union: there are also a few granulations at the external margin of each aperture made by the trephine, which, however, have done very little towards repairing the loss of bone at those parts.

222. A calvaria, from the left parietal bone of which an exfoliation is supposed to have separated. [It appears rather to have been a portion removed in consequence of a fracture which occurred a considerable time before the death of the patient. The margins of the apertures present externally some slight appearances of ossific granulations, similar to the preceding specimen.]

223. A section of a cranium, from which a large portion has been separated, or removed by absorption, from the posterior part of the right parietal bone, a considerable time before the death of the patient. [The ossific granulations have partially, but very imperfectly, supplied the loss.]

224. The upper part of a cranium, from the left parietal bone of which a large portion has been separated, apparently in consequence of fracture, and supposed to have been removed by the trepan. On the specimen is a label inscribed "De la Cimetière de la Paroisse de St. André à Rouen: supprimée à la Revolution Françoise, 1792. J. Ford."

225. A calvaria, from which a portion of the os frontis had been detached. The space where the bone is deficient is closed by a very dense and firm membrane, from the insufficiency of ossific granulations to close the aperture.

226. A section of the skull of an ass (?), from which a circular portion has been detached, [either by disease or design,] and the place of which is partially filled up by ossific granulations from the margin.

2. *Granulations from Cylindrical Bones.*

227. Granulations on the divided extremities of the ulna and radius after amputation.

228. The stump of one of the phalanges of a finger granulating.

229. Granulations on the divided humerus of an eagle.

230. The stump of a femur after amputation, showing the ossification of the granulations, which had taken place during the time of healing.
231. Granulations from the stump of a tibia, after amputation very near to the knee-joint.
232. Granulations from the divided extremities of the tibia and fibula after amputation. Both the bones are exceedingly attenuated towards the lower extremity, and are probably from an ill-conditioned or sugar-loaf stump.
233. The upper extremities of two fibulæ, which were granulating after amputation very near the knee-joint.
234. The stump of a tarsal bone of a turkey, granulations from which have produced anchylosis between the osseous substitutes for tendons and the bone.
235. Granulations from the anterior surface of a tibia.
236. A tibia, with ossific granulations on its anterior surface.
237. A longitudinal section of a tibia, from the anterior surface of which granulations have sprung up, in consequence of a large ulcer.
238. A tibia, with ossific granulations on its anterior surface. It is also thickened.
239. A tibia, showing ossific granulations surrounding a superficial ulceration.
240. A similar specimen. The granulations are much more luxuriant, and the ulceration more extensive.
241. An oval zone of granulations, raised about the lower extremity of a tibia, on its inner side.
242. A similar specimen.
243. A tibia, extensively ulcerated at its lower part, thickened, and surrounded by ossific granulations.
244. The lower extremity of a tibia, on the anterior surface of which granulations had formed, but had become partially dead, and were exfoliating.
245. Luxuriant granulations on the surface of a fibula.
246. The lower extremity of a fibula, on the anterior surface of which has been a large ulcer. The bone is thickened, and exhibits numerous granulations.

3. *Granulations uniting Compound Fractures.*

247. The superior portion of a femur, in which there had been a compound fracture from a musket bullet, which remained after granulations had

formed and ossified. The bullet was afterwards extracted, but the hole in which it was lodged is still seen in the newly formed bone.

248. A femur, from a case of compound fracture, partially united, but very much shortened and distorted.

249. A femur, from a case of compound fracture, partially united, with great deformity; and a large sequestrum separating from the upper portion of the bone.

250. A similar specimen. The fracture is very oblique, and apparently occurred in consequence of gun-shot: the fractured ends are much displaced; the pointed extremity of the upper portion having descended so low, that it probably entered the cavity of the knee-joint, and is marked out for exfoliation. A slight degree of union had taken place in some parts.

251. A section of a femur which had been fractured, showing a portion of the shaft become dead, and under the process of exfoliation. This part is surrounded by new bone.

252. A tibia and fibula, which have suffered compound fracture. The broken ends of the tibia having ridden considerably, induced the Surgeon to saw off a considerable part of the upper end. This operation probably deadened the bone at this part, and a large exfoliation of its whole diameter is seen taking place, which prevented the union of the bone by granulations, until the exfoliation was effected. While this process was going on in the tibia, an attempt at union was taking place in the fibula.

253. A tibia, from a case of compound fracture. The bone is firmly united, but with distortion.

254. The lower extremity of a tibia, from a case of compound fracture. The surface of the bone is covered with ossific granulations.

255. A metatarsal bone and phalanges of a toe, which have been fractured and united together by ossific granulations.

Series VI. Anchylosis.

1. *Lateral Anchylosis.*

"The first or lateral anchylosis is where bones are united by their sides, in consequence of ossific inflammation."

256. The first and second ribs of the right side, firmly anchylosed laterally, [by a dense bony plate resembling the natural structure of the ribs, and remarkably smooth on the inner side.]

257. Two ribs, [apparently those of a sheep,] anchylosed laterally through nearly their whole extent.

258. The metacarpal bones of the middle and ring-finger united by lateral anchylosis.

259. Two metacarpal bones of a lion, showing similar union.

260. The transverse process on the left side of the last lumbar vertebra and the os sacrum, anchylosed.

261. A similar specimen, with anchylosis on the right side.

262. The right femur, firmly united to the ischium by a large process of bone from the little trochanter.

263. The remains of a tibia and fibula in a stump after amputation, anchylosed at their divided extremities. The bones are much reduced in size, and become exceedingly light.

264. The left tibia and fibula of a young lion (?), anchylosed laterally.

265. The tibia and fibula of a lion, united by lateral anchylosis throughout almost their whole extent.

2. *Anchylosis by Ossification of surrounding Parts.*

"The union of two bones constituting a joint, by means of the ossifying of the surrounding parts making no part of that joint; and which anchylosis is generally found in the vertebræ."

266. Four cervical vertebræ, in the state of incipient anchylosis.

267. Two cervical vertebræ, anchylosed by ossific deposit on the anterior surface of their bodies.

268. Sections of two cervical vertebræ, anchylosed in a similar manner.

269. A spinal column, in which most of the vertebræ are partially united by lateral anchylosis. [Some of the ribs have been fractured and re-united.]

270. Several cervical vertebræ of a feline animal, anchylosed by means of a bony process extending from the spine of the vertebra dentata along the depression between the spinous and transverse processes of the right side.

271. Eight of the lower dorsal vertebræ of a lion, which were beginning to anchylose. The newly formed bone arising from the bodies of the vertebræ may be seen shooting towards the adjoining vertebra, where it is meeting similar bony processes.
272. Two dorsal vertebræ of a lion, firmly anchylosed anteriorly.
273. Six lower dorsal and first lumbar vertebræ, partially anchylosed, [by processes of new bone projecting from the anterior edges of the adjoining vertebræ, to obviate an increasing curvature forwards.]
274. Six dorsal vertebræ, in the state of firm lateral anchylosis.
275. The five lower dorsal vertebræ of a laterally incurvated spine, showing that an additional support of new bone has been deposited on the sides of the bodies, in the hollow of the curve; forming an anchylosis.
276. Four dorsal vertebræ, anchylosed along the sides of their bodies.
277. Four dorsal vertebræ, anchylosed along the front of their bodies.
278. Two lumbar vertebræ, united by lateral anchylosis.
279. Three cervical vertebræ of an ostrich, anchylosed.
280. Two cervical vertebræ of the same bird, anchylosed in a similar manner.
281. Two lower cervical vertebræ of the same bird, anchylosed laterally, with some distortion.
282. A dorsal vertebra of the same bird, with which the head of a rib that had been fractured is anchylosed.
283. All the cervical and four dorsal vertebræ of a lion, firmly anchylosed.
284. The scapula and os humeri of a lion, showing anchylosis in progress, in consequence of the formation of bony processes which pass from the scapula towards the humerus, and from the humerus towards the scapula.
285. Two lumbar vertebræ of a white bear, anchylosed laterally.
286. Two lumbar vertebræ of a horse, anchylosed laterally.
287. Six dorsal vertebræ of a horse, anchylosed both by their bodies and spinous processes.
288. A longitudinal section of five dorsal vertebræ of a horse, united by lateral anchylosis.
289. A portion of the spine of a cartilaginous fish, [probably a large ray,] showing anchylosis in progress, in consequence of a supposed fracture of one of the vertebræ.

290. The vertebra dentata and third cervical vertebra, anchylosed by their oblique processes, on one side.

291. The vertebra dentata and third cervical vertebra, anchylosed both by their bodies and oblique processes.

3. *Anchylosis by means of the Ossification of the Capsular Ligament.*

292. Four lumbar vertebræ, anchylosed by means of the ossification of the capsular ligaments of the oblique processes.

293. Three dorsal vertebræ of an incurvated spine, united by the same means as the last specimen, and also by anchylosis of their transverse processes.

294. The last cervical, and eleven of the dorsal vertebræ, exceedingly distorted. The lower seven vertebræ, and a rib, are firmly anchylosed.

295. A portion of the spine, in which the vertebræ and corresponding ribs are united by anchylosis.

296. The right shoulder-joint of a feline animal, in which the capsular ligament and other surrounding parts have become ossified; but the articulating surfaces of the scapula and os humeri had not taken on the ossific process. [The inflammation has been apparently induced by a dislocation of the humerus.]

297. The left scapula and humerus of the same animal, in a similar state, but in a less degree than the preceding specimen.

298. The right humerus, ulna, and radius, of a large feline animal, [probably a lion,] in which the motion of the elbow-joint is limited, in consequence of partial ossification of the capsular ligament.

299. The left humerus and ulna of the same animal, in a similar state, but in a less degree.

300. The lower extremity of the left radius of a horse, anchylosed with three bones of the carpus; and the remaining carpal bones are anchylosed with those of the metacarpus.

301. The tarsal anchylosed with the metatarsal bones of the right hind-leg of a horse.

302. The metacarpal bone of the near fore-leg of an ox, firmly anchylosed with the first phalanges and sesamoid bones.

303. A tarsal and metatarsal bone, anchylosed apparently by the ossification of the capsular and lateral ligaments.

4. *Complete Anchylosis of Joints.*

a. *Anchylosis where there is but little Motion.*

304. A longitudinal section of the second and third cervical vertebræ, where union has taken place between the bodies, by means of the ossification of the intermediate substance, and also between the oblique processes.
305. A longitudinal section of the fourth and fifth cervical vertebræ, where union has taken place by means of ossific inflammation in the intermediate substance.
306. A large portion of a spinal column, much incurvated forwards; and the bodies of five dorsal vertebræ anchylosed.
307. Two lumbar vertebræ, anchylosed both by their articulating surfaces, and laterally.
308. The sacrum and left ilium, anchylosed.
309. The sacrum and ossa ilii, anchylosed by the whole surface of the sacro-iliac symphysis.

b. *Anchylosis where there is a Capsular Ligament.*

310. The condyles of the os occipitis anchylosed to the atlas.
311. An os humeri and ulna, anchylosed.
312. A humerus, ulna, and radius, firmly anchylosed at the elbow-joint.
313. The head of a femur, very firmly anchylosed to the whole surface of the acetabulum.
314. A similar specimen, but with more distortion, in consequence of the shortening of the neck of the femur.
315. A femur and tibia, united by anchylosis of their articulating surfaces. A strong ridge of bone has been formed in the poplitæal space, for the purposes of support. There has been an oblique fracture of the tibia near its lower extremity.
316. A femur and tibia, anchylosed by their articulating surfaces.
317. A similar specimen, divided longitudinally.
318. The tibia, fibula, os calcis, and bones of the tarsus, firmly united by anchy-

losis. [This is complicated with fracture of the tibia and fibula near the middle, which are united with some degree of distortion. The ossific inflammation extended nearly to the knee.]

319. An analogous specimen, showing nearly the same circumstances. The lower end of the tibia is enlarged, and contains a small sequestrum.

320. A tibia, fibula, os calcis, astragalus, and os naviculare, united by anchylosis. Sections have been made to show the extent of the union.

321. An astragalus, os calcis, the tarsal, and three metatarsal bones, anchylosed.

322. A right astragalus and os calcis, anchylosed on their inner side.

323. The left astragalus and os calcis, from the same individual, anchylosed precisely in the same manner.

324. A longitudinal section of the great and little pastern bones of the foot of a horse, which are anchylosed in consequence of violent ossific inflammation.

325. The foot-lock or coronary bones, the nut-bone, and the coffin-bone or terminal phalange, of the foot of a horse with a stiff joint, anchylosed in consequence of ossific inflammation.

326. The greater coronary, together with the lesser coronary bone, the nut-bone, and coffin-bone of the foot of a horse, anchylosed in consequence of ossific inflammation.

Series VII. Exfoliation.

1. *Process in Wood analogous to Exfoliation in Bone.*

327. A longitudinal section of the branch of a tree, from which a portion of the bark was intentionally removed, which induces a process in wood analogous to exfoliation in bone. The part of the wood which is dead and beginning to separate is distinctly marked.

328. A similar specimen, from which a larger portion of bark had been removed.

329. A similar specimen, in which the bark had been removed longitudinally, where the process of separation is further advanced.

2. *Process in Bone preparatory to Separation.*

330. An os frontis, on which a portion of the bone is marked out for exfoliation;

from a person who died in consequence of a blow on the head. Being scalped, and no fracture discovered [although it did exist], the patient was not trepanned; but suppuration having taken place some weeks after the injury, the surface of the bone which was exposed in consequence of scalping became dead, and exfoliation had begun to take place.

331. A calvaria, in which a large portion of the external table of the os frontis had become dead, and was distinctly marked out for separation, and is readily distinguishable by its white colour.

332. A similar specimen; in consequence of a blow on the head.

333. A calvaria, showing a similar exfoliation taking place from a parietal bone.

334. A calvaria, in which may be observed an exfoliation from the os frontis further advanced. [A large part of both the external and internal surfaces of the bone seems to have been removed by absorption, apparently subsequent to fracture.]

335. A calvaria, showing an exfoliation which extends through both tables of the frontal bone, nearly detached.

336. A calvaria, in which death had taken place in two parts of one of the parietal bones, adjoining the sagittal suture, in consequence of some disease. In one part the exfoliation was complete, *i. e.* extending through both tables of the skull, and has separated; in the other, the internal surface of the sequestrum being broader than the external, prevented its separation. Several other ulcers existed in various parts of the skull.

337. Two portions of skull; one removed by the crown of a trephine, the other by the trephine and saw; where part of the bone had become dead, and was marked out by the absorbents for exfoliation.

338. The upper part of the femur of a young subject, from which a portion of the shaft is marked out for separation, having become dead apparently in consequence of a fracture of the bone near its middle. The periosteum, as is usual in such cases, exhibits marks of inflammation above the line of demarcation.

339. A similar specimen from an adult; [apparently after amputation.]

340. The upper portion of a femur, [apparently after amputation,] at the divided extremity of which, the absorbents were detaching a considerable part of the shaft of the bone, preparatory to exfoliation.

341. A portion of the stump of the femur of a young subject, after amputation, with an exfoliation separating from the divided extremity, and luxuriant granulations from the periosteum above this part.

342. A section of the stump of a femur, in a similar state. The actual cautery had been applied, to hasten the process of separation.

343. Part of a tibia after amputation, from which a considerable portion is marked out for exfoliation; [probably in consequence of the bone being splintered at the time of its division.]

344. A section of a tibia after amputation; the process further advanced.

345. Part of a tibia, from which the separation of a considerable portion is almost accomplished.

346. Part of a tibia, with a portion separating from its lower extremity; probably subsequent to fracture. This specimen has been divided longitudinally.

347. The two adjoining portions of a fractured tibia, showing a sequestrum separating from each of the broken ends.

348. A portion of a fibula which has been fractured, showing a sequestrum separating from each of the broken ends.

349. A portion of a tibia, from which two sequestra are nearly detached, which have the whiteness and density of ivory.

350. A portion of a tibia, in which a large part of the shaft forms a sequestrum which is nearly detached, and its place supplied by newly formed bone; [probably after amputation.]

351. A portion of a fibula, from which an extensive exfoliation of the entire substance of the bone is taking place. [Probably from the same limb as the preceding specimen.]

352. A tibia, from which a large exfoliation is taking place, subsequent to a fracture of that bone below its middle. The fibula has been fractured near its upper end, and towards its lower extremity is united by lateral anchylosis to the tibia.

353. A tibia and fibula, from which sequestra were separating. The ossific inflammation was forming new bone around the tibia, and producing lateral anchylosis between the tibia and fibula, while ulceration was marking very distinctly the greater part of the shaft of the tibia for exfoliation. All

these effects were taking place in consequence of a fracture of the tibia and fibula near their lower extremities.

354. Necrosis of the tibia after amputation. [The stimulus of death appears to have gradually extended from the divided extremity to the tuberosity.]

3. *Results of Experiments to show the Process of Exfoliation.*

The following eight preparations comprehend the results of a series of Experiments which were made on the metacarpal and metatarsal bones of asses to show the progress of exfoliation.

355. A metacarpal bone, which had been drilled or perforated transversely near its middle. The surrounding parts of the bone are thickened in consequence of the ossific inflammation.

356. A similar specimen, divided longitudinally, to show the effect of the injury on the inner surface of the bone.

357. A similar specimen, divided longitudinally, to show a deposit of bony matter within the medullary cavity, which forms a bony tube by which the external surfaces communicate with each other across the canal.

358. A transverse section of a metatarsal bone, to show the same circumstances.

359. A metatarsal bone, to which the actual cautery had been applied, and a sequestrum formed; but which, though perfectly detached, could not separate, on account of its being confined by the surrounding newly formed bone, and consequently could only have been removed by the absorbents, or by art.

360. A longitudinal section of a metatarsal bone, in which half of the sequestrum is attached by wire in its relative situation.

361. A longitudinal section of a metatarsal bone, from which the sequestrum has been removed, to show the interior of the cavity that contained it.

362. Ossific granulations from the metacarpal bone of the near fore-leg; where a similar sequestrum had been inclosed, but has been removed.

4. *Sequestra separating from the Surface of Bone.*

363. A scapula, in the inferior costa of which is partly inclosed, in newly formed bone, a sequestrum formed in consequence of a gun-shot wound.

364. The humerus of a swan, from the surface of which a sequestrum of considerable extent has separated. The centre of the sequestrum is perforated, as if by a small shot.

365. A radius, in which a large portion of its surface, and apparently of its substance, was in progress towards exfoliation.

366. Part of a tibia, which had been often in a state of ulceration; and by being laid bare for some extent, the exposed surface became dead, and the process of separation had just begun.

367. The lower part of a tibia, in which two portions of the bone had become dead, and are distinctly marked out for exfoliation.

368. The lower part of a tibia, from which an oval portion was exfoliating, in consequence of the application of the actual cautery to the exposed surface of the bone, in an ulcer of the leg.

369. The tibia and fibula of a man whose foot mortified and dropped off in consequence of a poplitæal aneurism, of which the patient died before a separation of the ends of the bones took place. The tibia was not exposed regularly all round, but only on one side: the surface of the original bone, being within the influence of the ossific inflammation and granulation, is there covered by new bone, which is uneven on its external surface. The mortification having extended highest on the outside of the leg, a larger portion of the fibula was exposed. [See Preparation, No. 144, Dry. The femur belonging to this extremity. Whether the patient was operated on for the aneurism, and the foot mortifying from that cause, or not, is not recorded.]

370. The lower half of a tibia of a young subject, from which an extensive sequestrum was separating. [The exfoliating portion is dividing into laminæ in an unusual manner, probably in consequence of the application of the actual cautery; and there is a small fistulous canal extending from one side of the tibia to the opposite, as if occasioned by small shot.]

371. A tibia, from the anterior surface of which a large sequestrum has separated. The bone had evidently been long and extensively diseased.

372. The upper part of a tibia, a portion of the surface of which had become dead, and nearly separated. The sequestrum is partially inclosed by newly formed bone.

373. A tibia, in which ulceration had taken place all round the head of the bone, and some way down its shaft: also mortification or death had taken place in several parts of the bone, which extended some way into its substance, and became the cause of a continued sore, from the difficulty nature had to get rid of the exfoliated pieces of bone.
374. A tibia, the upper half of the shaft of which had become dead, but is not surrounded by new bone.
375. A tibia, the lower part of which is in a state of necrosis.
376. A similar specimen. The cavity containing the sequestrum communicated with the joint by a large aperture.
377. A similar specimen. A dead portion is inclosed in a bony case on the anterior and middle part of the bone. Several fistulous apertures communicated with the surface.
378. A section of the lower extremity of a fibula, part of which was exfoliating.
379. The lower part of a fibula, from which the inferior portion has been nearly separated.
380. A fibula, of which the lower half is marked out for separation.
381. Part of a fibula, the upper portion of which was exfoliating; apparently subsequent to fracture.
382. Another specimen.
383. The lower extremity of a fibula, in an ulcerated state, much enlarged, and containing a sequestrum.
384. Two sections of an os calcis, from the articulating and other surfaces of which exfoliations were separating.
385. Two sections of an astragalus, to show the same circumstances.

5. *Death and Regeneration of the whole Shaft of a Bone.*

386. A humerus of a young subject, from which the shaft appears to have been exfoliated, and replaced by a case of newly-formed bone. [The original epiphysis of the lower extremity remains, but seems to have undergone considerable change from absorption at the point of contact with the newly formed bone.
387. An example of necrosis of the ulna and radius, where the original bones had almost entirely disappeared, and have been replaced by newly formed bone.

388. A thick irregular case of bone surrounding the ulna; formed to supply its place after necrosis of that bone.
389. A tibia, of which nearly the whole shaft has been regenerated after necrosis.
390. Necrosis of the tibia nearly through its whole extent; the extremities only having escaped.
391. Another specimen.
392. Another specimen.
393. Another specimen. Nearly the whole of the shaft had become dead; little more than the original epiphyses remaining.
394. A new shaft of a tibia, formed after the death of the original bone, a considerable part of which still remains enclosed in the newly formed bony case.
395. A similar specimen. The original extremities appear to remain.
396. Another specimen, from a young subject, where a large part of the body of the bone is detached, but enclosed in a newly formed bony case.
397. A tibia of a young subject, which appears to have been regenerated after the death of a great part of the original bone.

6. *Bones from which Exfoliations have been separated.*

398. The superior portion of a femur, from which exfoliation has taken place after amputation.
399. The upper part of a femur after amputation, from which exfoliation had taken place; showing granulations surrounding the end of the bone.
400. A portion of a femur, near its middle, divided longitudinally; exposing a cavity which probably contained a small sequestrum. The surrounding bone is much thickened in consequence of the ossific inflammation.
401. The lower end of an os femoris, considerably thickened; with ossific deposit in the periosteum in consequence of inflammation. The bone is divided longitudinally, to show necrosis. In the medullary canal a circumscribed cavity is formed, containing a sequestrum of part of the cancellated structure; and there is a fistulous canal leading from the cavity which contains it.
402. The lower part of a femur, much thickened, and of an uniform spongy tex-

ture at the part where the section has been made. The medullary cavity is almost entirely obliterated by bony deposition; but at the lower and posterior part there is a large aperture which was probably for the escape of a sequestrum.

403. A tibia, in which only a very small part of the original bone remains. At the upper end a portion of the newly formed bone is removed, to expose a small remaining sequestrum contained in a cavity from which several fistulous canals lead to the external surface of the bone.

404. A longitudinal section of a tibia, from which sequestra have been removed. Its medullary cavity is nearly obliterated by ossific deposit.

405. A similar specimen. Its cavity is also nearly obliterated by ossific deposit.

406. A tibia, much thickened and ulcerated. A large sequestrum has probably been thrown off.

407. A portion of a tibia, from which an exfoliation had taken place.

408. A similar specimen. Great part of the remaining shaft of the bone had become dead.

409. The lower part of a tibia, from which a superficial sequestrum had separated.

410. A tibia, the lower end of which is swollen and ulcerated, and the medullary cavity exposed, in consequence of death in a part of the bone.

411. The lower part of a tibia, which is affected similarly to the preceding specimen; [probably after the separation of a dead portion.]

412. The upper part of a fibula, greatly enlarged by the formation of new bone, in consequence of the death of the original bone at this part.

413. A digital phalanx, enlarged at its middle from a similar cause.

7. *Sequestra.*

414. A sequestrum, separated from the skull.

415. A similar specimen.

416. Two small portions of skull, which exfoliated.

417. Three small portions, similar.

418. An oblong portion of a skull, comprising a large part of the os frontis and ossa parietalia, which exfoliated.

419. A portion of the os frontis, which was thrown off, after having been much

acted on by the absorbents. The diplöe is almost entirely destroyed by ulceration, the two tables of the skull being separated from each other through almost their whole extent. The disease was probably venereal.

420. Several portions of skull, which have been exfoliated.

421. A great portion of the inferior maxillary bone of a child, containing several teeth, which exfoliated in consequence of a scrofulous affection.

422. A large portion of the anterior part of the lower jaw of an adult, which exfoliated. The actual cautery had been previously applied.

423. A sequestrum, comprising a considerable part of the shaft of a humerus, which having become dead, and surrounded by a case of new bone, is termed "an internal exfoliation." The surface of this sequestrum has been much acted on by the absorbents, and had been touched by the actual cautery before its final separation. The old label describes it as "An internal exfoliation from Mr. Maitland's os humeri, 1775."

424. A similar sequestrum, apparently from a humerus.

425. A small sequestrum, from the end of a femur, after amputation.

426. Four sequestra, which have been separated from cylindrical bones after amputation.

427. A large portion of the shaft of a femur, which became dead and separated after amputation.

428. A sequestrum, from the surface of a tibia.

429. A considerable portion of a tibia, which, having become dead, has had the actual cautery and trephine applied to it, to accelerate its separation and removal.

430. Two portions of a tibia, which were exfoliated after a compound fracture of that bone.

431. A considerable portion of the shaft of a tibia, which, having become dead, was thrown off, or removed. Its old label describes it as "An exfoliation from the tibia of a girl, eight years of age, which was supplied with new bone; and now is well, and walks."

432. A sequestrum, from the middle of a tibia, with a fistulous aperture leading to the cavity containing it, through the newly formed bone.

433. A large sequestrum, from the surface of a tibia, [chiefly if not entirely composed of newly formed bone, which apparently enclosed or confined

a sequestrum from the original bone underneath, similar to the preceding specimen.]

434. A sequestrum of part of a fibula, with a portion of a newly formed bony case, which surrounds it.

Series VIII. Dislocations.

435. The clavicle and scapula of a young subject, in which the clavicle has been dislocated from the acromion scapulæ, with apparent fracture of both the bones.

436. The bones composing the shoulder-joint, showing that the head of the humerus is luxated inwards and upwards; in which situation a new glenoid cavity has been formed for it, between the inferior costa of the scapula and the coracoid process.

437. The bones composing the elbow-joint, showing a luxation of the radius. The form of both the ulna and radius is altered, to adapt them to each other in their new relative situations.

Series IX. Scrofula.

1. *Mollities Ossium.*

Deficiency of deposit of earth; or absorption of the earth originally deposited.

438. A section of the humerus, together with the ulna and radius, and several bones belonging to the hand, of a woman who died of mollities ossium. Some of the bones had been broken in several places. [See No. 603. Pathological Preparation in Spirit,—the other section of the humerus from this extremity.]

439. The upper portion of a right femur, affected with mollities ossium, which appears to have been fractured.

440. The left femur, from the same individual as the preceding specimen, which had been fractured, apparently at some distance of time previous to death, there having been an effort towards re-union.

441. Various bones of a monkey, in a very soft and brittle state. They are much thickened, and exceedingly light.

442. Various bones of a young lion, in a similar state; some of which had been fractured, and others much curved.

443. A portion of the vertebral column of a young subject, from which a considerable proportion of the earthy part of the bone has been absorbed; [probably from a case of psoas abscess.]

444. A portion of an adult sacrum, which has lost much of [or is deficient in] its earthy matter, being exceedingly light.

445. The upper extremity of an adult femur, which is remarkably light, when compared with its bulk and apparent density.

446. A femur of a rickety person, but slightly curved, and remarkably light in proportion to its bulk.

447. A tibia, which is unusually light, without any alteration of its external appearance, in consequence of a disease analogous to that which has affected the five preceding specimens.

448. An adult femur, of a very unusual character. It is of the ordinary length (15 inches) and straight, but of such exceeding tenuity, that at its middle it does not exceed five-eighths of an inch in diameter. [Whether this singular state of the bone was congenital, or induced by rachitis, paralysis, or other cause, there is no record.]

2. *Rachitis.*

a. *Producing Curvature in Cylindrical Bones.*

449. The right humerus of an adult rickety person, slightly curved.

450. The left humerus of the same individual.

451. The left humerus of a rickety person, more curved.

452. A femur of a rickety person, but slightly curved.

453. A femur, sufficiently ponderous, but curved forwards more than natural, and its head and neck at nearly a right angle with its shaft.

454. A similar specimen, but more characteristic of the disease.

455. The right femur of a rickety person, very similar to the last specimen. [See No. 461. Dry. Apparently belonging to this extremity.]

456. The left femur of the same individual. [See No. 462. Dry.]

457. A right femur, in which the character of the disease is strongly marked; the head and neck being at nearly a right angle with the shaft, the shaft highly curved forwards, and the linea aspera greatly produced, or increased in breadth. [See No. 463. Dry.]

458. The left femur, from the same individual, in a similar state.

459. A tibia, with a considerable curve inwards, in consequence of rickets.

460. A dense and ponderous tibia, curved forwards, and compressed laterally.

461. A right tibia and fibula, considerably curved forwards. The fibula, greatly increased in breadth and thickness, answers the purpose of an abutment to the tibia. [These bones apparently belong to the same limb as No. 455. Dry.]

462. The left tibia and fibula of the same individual, [and apparently belonging to the same limb as No. 456. Dry.]

463. A right tibia and fibula, in a similar state; but more remarkable than any of the preceding specimens, in consequence of the tibia having thrown out a bony process, or exostosis, which is received into a correspondent notch in the fibula; by which means the fibula is rendered a perfect splint or abutment to the tibia. [These bones apparently belong to the same limb as No. 457. Dry.]

b. *Producing Crooked Spine.*

464. A natural skeleton of an adult spine, in which the degree of distortion is but small.

465. An adult spine, in which the degree of distortion is very considerable, in consequence of counterbalancing curves to the right, to the left, and forwards.

466. A natural skeleton of the trunk of a female, where the degree of distortion is much greater.

3. *Scrofulous Affections of the Skull.*

467. Some of the separate bones of the head of a rickety child, which are thickened; and some of their surfaces have a singular sandpaper-like appearance.

468. A section of the cranium of a rickety (?) child, which is much thickened;

with very little distinction between the texture of the tables and the diplöe.

Series X. Hydrocephalus.

469. The cranium of a child, considerably enlarged.
470. Another specimen.
471. The calvaria of a child, still more enlarged. A very instructive specimen.
472. Another example; the head still more enlarged; the ossification not so far advanced.
473. Another still larger example of a hydrocephalous skull.
474. Part of the bony compages of a hydrocephalous skull.
475. The calvaria of a very diminutive dog, on which is inscribed "Dog 15 years old." [It has the appearance of having been affected either by hydrocephalus, or hydatids in the brain; there being three or four spots in which the bone is deficient, and the spaces occupied by membrane. From the general aspect of the specimen, however, the age of the animal was more probably 15 weeks or months than years.]

Series IX. Syphilis.

a. *Affections of the Skull.*

476. The anterior part of a skull, in which the os frontis is affected by the venereal disease, [internally as well as externally.]
477. A calvaria, very extensively ulcerated on its external surface only. [Probably venereal.]
478. A skull, the frontal and parietal bones of which are extensively affected by venereal (?) ulceration. The fangs of the remaining teeth are exposed, in consequence of the alveolar processes having been absorbed.
479. A calvaria, which is ulcerated both on the external and internal surfaces. In one part the ulceration has penetrated through the bone, so as to produce a considerable aperture. [This specimen has the following memorandum written within it: "Sept. 3. 1779. Died about 5 weeks ago, aged 19. G. Brande;" and in addition, in Mr. Hunter's hand-writing, "Supposed to be venereal."]

480. A calvaria, very extensively ulcerated. [Probably venereal.]
481. A calvaria, in which the parietal bones are extensively ulcerated. "Supposed to be venereal."
482. A similar specimen, in which the os frontis is principally affected. "Supposed to be venereal."
483. A similar specimen. A large portion of the right parietal bone has been destroyed.
484. A skull, with the lower jaw; in which the palate, part of the nasal bones, and orbits are destroyed. All the teeth of the upper jaw have separated, and the alveolar processes have been removed: in the lower jaw two molares only remain, and these are retained merely by the curved points of their fangs; the alveolar processes having been almost entirely absorbed.
485. The basis of a skull, in which the palate is almost entirely destroyed.
486. A lower jaw, of which a great part is destroyed by ulceration.

b. *Affections of Cylindrical Bones.*

487. A clavicle, scapula, and humerus, on which there had been venereal ulcers.
488. A portion of the os frontis, the ulnæ, femur, and tibia, of the same individual, affected by venereal ulceration.
489. A tibia, affected by the venereal disease.
490. A fibula, [apparently belonging to the preceding tibia,] from which grew a large venereal excrescence.

Series XII. Exostosis.

a. *From the Skull.*

491. A portion of a frontal bone, having two small and very dense ivory-like exostoses upon its anterior surface.
492. A calvaria, having a larger exostosis of a similar texture on the posterior edge of the os frontis, on the right side.

b. *From Cylindrical Bones.*

493. The right humerus of a young and apparently rickety subject, from the upper half of which several exostoses have arisen.

494. Part of an ulna and radius, much distorted, apparently in consequence of rickets; from each of which bones an exostosis has arisen. They probably belonged to the same individual as the preceding specimen.
495. A femur, with an exostosis just above the inner condyle; from a subject apparently rickety.
496. A portion of femur, with an exostosis above its inner condyle.
497. A large bony protuberance, on the front of a femur, above its middle. [But apparently an ossification, and not a genuine exostosis.]
498. A large exostosis on the front of a femur.
499. A very similar specimen.
500. An exostosis from the right femur.
501. An exostosis from the left femur of the same individual.
502. An exostosis from the right tibia of the same individual.
503. An exostosis from the left tibia of the same individual.
504. A portion of a tibia, with a minute but dense exostosis on its anterior surface.
505. A section of a tibia, with a conical process or exostosis arising from it. In this instance the exostosis is a distinct formation on the surface of the original bone.
506. The upper end of a fibula, with spicula of bone projecting from it. [This specimen appears to be the stump of a fibula after amputation near the knee.]
507. The tibia of a fowl, somewhat thickened; with singular spinous exostoses.

Series XIII. Bony Tumours.

a. *Tumours in Bone.*

508. A section of the anterior part of a cranium, to show a very singular bony tumour of considerable size, which occupies the left orbit, part of the right, and the lower part of the os frontis anteriorly: and, on the posterior side, projects into the cavity of the skull, where it must have pressed on the brain. This tumour is lobulated, irregularly rounded,

very dense in its texture, which much resembles that of ivory; and is a disease extremely rare.

b. *Tumours on Bone.*

509. The left scapula of a woman, which was surrounded by an encysted tumour. It has undergone ulceration and ossific inflammation.

510. A bony tumour of considerable size on the first phalanx of a finger.

511. A specimen of the bony matter of a tumour, which occupied the right side of a male pelvis, and involved the os sacrum, ilium, and pubis, in a profusion of newly formed bony spicula.

512. Two sections of a bony tumour, of a large size and dense texture, which arose from the lower part of a femur, chiefly on its posterior surface, and extending downwards into the ham, much impeded the motion of the joint. On this account the limb was amputated; but as soon as the stump began to heal, difficulty of breathing commenced, and the death of the patient soon followed. On examination it appeared that a kind of metastasis had occurred; bony deposit to a great extent had taken place in the pleura costalis, and the lungs had become almost solid masses of bone. [See Nos. 532 and 533, Dry. See also portions of this tumour, preserved to show its recent structure, Nos. 461 and 462, Pathological Preparations in Spirit.]

513. Two sections of a tumour similarly situated. The distinction between the original bone and the substance of the tumour is very clearly defined, the latter apparently originating in the periosteum.

514. A bony tumour on the lower end of a femur. The inner condyle has been destroyed, apparently by ulceration.

515. A very large cauliflower-like tumour, radiating from the end of the bony core of the horn of an ox, apparently after some accidental injury to the horny covering.

516. A rib of a horse, nearly the whole substance of which is occupied with, or converted into, a singular bony tumour, of a spongy texture, everywhere traversed by large canals, and furrowed and indented externally.

517. Several ribs of a chameleon, with rounded bony protuberances on them; supposed to have been fractures united. [They are, however, more

probably scrofulous tubercles; as on some of the ribs there are several of these enlargements in succession.]

c. *Tumours of Bone.*

518. Two sections of a small irregular cauliflower-like bony tumour.

519. Two sections of a rounded bony tumour, with an irregular surface; which was found in a grave. This tumour, from some resemblance, was supposed, by the person who presented it to Mr. Hunter, to be a urinary calculus.

Series XIV. Ossifications.

1. *In Cartilage.*

520. The thyroid cartilages, ossified.

521. The cartilages of the larynx and trachea, ossified.

522. The cartilages of the lower portion of the trachea, ossified.

523. The cartilages of the first pair of ribs, ossified, and anchylosed to the sternum.

524. A rib, with a portion of its cartilage ossified.

525. A sternum, having the xiphoid cartilage, and nearly all the cartilages of the true ribs, ossified.

526. Portions of the cartilages of the ribs, ossified.

527. Cartilages of the last true ribs of a large quadruped, ossified. [Apparently those of an ox.]

528. Cartilages of some of the false ribs, in a similar state, together with ossification of some of the surrounding parts. [Apparently from the same animal.]

529. Cartilages of some of the false ribs of a large quadruped, which have been fractured, and united by bony deposit.

2. *In soft Parts.*

530. A portion of dura mater, with small bony spicula on each side of the falciform process.

531. A small portion of dura mater, with ossification on the right side of the falx.

532. The spinal column and ribs from the same individual as the specimen No. 512, Dry, in whom large bony tubercles had formed in the lungs; part of which adhere to the pleura costalis on each side.

533. The trachea and lungs of the same subject as the preceding specimen. The lungs are ossified, or occupied by large bony tubercles, to a very considerable extent.

534. The skeleton of a man, thirty-nine years of age, which is very remarkable for the production of ossific growths from many parts, of various dimensions and extent;—some forming exostoses merely, whilst others pass from one part of the skeleton to another, and have thus produced anchylosis or immobility of most of the members. The exostoses may be observed on the os frontis, mastoid process, and occiput, and in other parts of the skeleton where muscles are inserted; as, near the angle of the lower jaw, where the masseter is inserted; at the extremities of the spines of the vertebræ; at the coronoid processes of the ulnæ; in the femur, at the part where the glutæus maximus is implanted; &c.

The second, and more extensive kind of ossifications, have in general followed the course of the larger muscles; and may be seen, on the right side, in the situation of the deltoid, joining the clavicle and acromion of the scapula to the humerus; in the situation of the supra-spinatus; and passing from the inferior angle of the scapula to the humerus, in the situation of the teres major and latissimus dorsi. On the back, more extensive ossifications of the muscles appear, which affix the scapulæ on both sides to the sacrum and ilium, and to the spines of the lumbar and dorsal vertebræ. On the left scapula, the ossification of the teres major has not extended quite to the humerus, but the dorsum presents a singular process or ossification with smooth sides, and a flattened overhanging margin, like an auxiliary or second spine.

From the pelvis, ossifications extend from the sacrum and ilium in the direction of the glutæus magnus; and from the tuber ischii and os pubis, in the course of the biceps and triceps adductor muscles. These extend to the right femur.

Ossifications of the tendinous and ligamentous parts appear to be still more common: producing anchylosis of the vertebræ; of the left elbow-

joint; of the tibia and fibula to each other, on both sides; of the ankle-joints; and general consolidation of the bones of the tarsi.

535. "A small portion of bone, coughed up from the lungs of a nobleman." [Under what circumstance is not recorded: but without further explanation, the impression would naturally be that it was a bony concretion formed there, and expectorated: but this does not appear to have been the case. This substance is very dense bone; one part of it has a high degree of polish, and has more the appearance of a portion of a decayed tooth than that of any other kind of bone. It must be useless to conjecture, were it of any import, or it might be conceived that a portion of a tooth had become detached during sleep, and having passed into the fauces or trachea, on producing irritation was expectorated.]

536. An osseous tumour, composed chiefly of spherical granules of the size of mustard seeds, formed in the lungs of a turkey.

537. Bony tubercles, composed chiefly of calcareous matter, formed in the lungs of a camel.

538. Calcareous matter from the lungs of an ox.

539. Two minute osseous concretions from the lungs, immediately under a cicatrix; and a still more minute one from the pineal gland, of a maniac.

540. "A small spicula of bone from the diaphragm of a horse." [It has not the appearance of having been an ossific deposit formed in that situation; but more probably has travelled from the cavity of the stomach, or some other viscus or part, similar to the progress which bones, needles, and other extraneous substances sometimes make. [For an example see No. 70. Pathological Preparation in Spirit.] Its surface much resembles that of bone which has been acted on either by the gastric juice, or by the absorbents.]

541. Two small singularly branching ossifications, from the liver of a sheep.

542. A portion of the capsule of the spleen, ossified.

543. Two small ossifications, in a portion of the tunica vaginalis.

544. A minute spherical tubercle, from the tunica vaginalis.

545. Small dense ossifications, from the coats of an artery.

546. Portions of ossified arteries.

547. Ossified lymphatic glands, on the surface of a blood-vessel.

548. Ossifications on a portion of the coat of an encysted tumour, from a sheep.

549. A similar specimen. Probably another portion of the same cyst.

550. The coats of an encysted tumour, ossified.

551. "Ossifications in the coats of an encysted tumour, which contains two loose bony tubercles." [Though the cyst now contains the two bony tubercles, there is no authority for supposing they were formed there; and are more probably only from the same viscus, or animal.]

Series XV. Bones affected by Gun-shot Wounds.

552. A calvaria, with a small leaden shot remaining imbedded in it. There are impressions of other shot, which had been received in the same part, but had subsequently been thrown out.

553. A parietal bone, in which are two deep indentations in consequence of gun-shot. The shot have been discharged or extruded from the wounds.

554. A section of a portion of the tusk of a young elephant, on the inside of which a leaden musket-ball projects, which is partially incrusted with newly formed ivory. [The ball had penetrated into that part of the tooth which was lodged in the socket or alveolar cavity: the splintered part on the external surface shows the situation of its entry.

One description will suffice to explain the manner in which the balls in this and the following specimens have been incased or imbedded in ivory. The tusk of an elephant being an extra-vascular substance, (like the teeth and tusks of other animals,) has consequently no powers of restoration beyond the point of the conical vascular pulp on which the tusk is formed: this pulp never extends beyond the limits of the alveolar cavity in which the tusk is situated, and therefore that part of the tusk beyond or external to the gum has no power of restoration, and is without sensation; so that an elephant's tusk (as most persons have had opportunities of observing) may be sawed off close to the jaw without giving pain to the animal. If a ball strike the exserted solid part of the tusk, it can at most only splinter it; but in all cases where balls are found imbedded in the

substance of the tusk, the animal has been shot in the face, and the ball has passed through the thin side of the base of the tusk, into the conical cavity containing the vascular pulp; whereby the natural functions of the pulp are deranged, inflammation is excited, and ossific or ivory deposit first begins in that part of the cavity or pulp which contains the ball; consequently it becomes enveloped in an ivory case (See No. 554). The deposit of ivory proceeds within the cavity of the tusk until the whole of it is filled; but it is generally very unlike the natural secretion, being usually of a yellower colour and granular. As the tusk continues to grow, it advances forwards, and the part containing the ball may be protruded to any distance beyond the jaw, but not until that part of the tusk is entirely filled with the ossific deposit.]

555. A section of the tusk of an elephant, in the cavity of which a ball is lodged, as in the preceding specimen; but the secretion of ivory has been much more abundant.

556. A section of the tusk of an elephant, under similar circumstances. The ball is entirely covered with newly formed ivory.

557. Two sections of the tusk of an elephant, to show an iron musket-ball imbedded in its substance.

558. A portion of the tusk of an elephant, in which an iron musket-ball had been received, and afterwards incased in the subsequently formed ivory.

559. Two other specimens, containing iron balls.

560. Sections of a similar specimen.

561. Another specimen, with its outer part splintered.

562. A section of the tusk of an elephant, where a leaden ball had passed, but the aperture is now filled up, and an ivory excrescence is formed on the inside. The ball was found opposite to this excrescence, on the other side, in the hollow of the tusk.

563. Three ivory excrescences, formed within the cavity for the pulp, in the tusks of elephants.

564. A larger excrescence of the same kind, and from the same situation.

Series XVI. Diseased Teeth.

565. A section of a tusk of a walrus, near its base; in which the cavity that contained the vascular pulp was beginning to be filled up with osseous tubercles.

566. A similar section of a tusk of a walrus, in which the cavity is more completely filled with granular ivory-like deposit.

567. An irregularly formed cuspidatus, which is extensively coated with tartar.

568. A section of the bones of the face, with the posterior molar tooth singularly incrusted with tartar.

569. An excrescence [apparently a large mass of tartar,] which formed upon the stump of a tooth on the left side of the upper jaw of Margaret Fillbey, at Heston in Middlesex, aged 70. It separated during her sleep, without pain.

570. Two teeth of a small dog, on which tartar had concreted.

571. A bicuspid tooth, the fang of which had increased in size, and caused so much pain as to create suspicion of disease in the antrum.

572. Two molar teeth, the fangs of which are greatly enlarged by ivory-like deposit. Also an incisor, with a spiculum of enamel, resembling an exostosis, on its anterior surface.

573. Two incisor teeth from a child, the fangs of which are united laterally.

574. A bicuspid tooth from a young lady, which had been transplanted, and remained four years. Also two incisors which had been transplanted, but had fallen out in consequence of the absorbents having acted on their fangs

575. A bicuspid tooth, which had been drawn, stopped, and replaced; which was followed by absorption of the fang, and the tooth dropped out.

576. An incisor tooth, which had been transplanted, but became dead; and the fang having been acted on by the absorbents, the tooth dropped out.

577. Various diseased teeth, and stumps of teeth.

578. A transverse section of the jaws of a lion, or tiger, which are much diseased; and several of the teeth have separated in consequence of ulceration.

579. The anterior part of the lower jaw of a lion, or tiger, containing diseased teeth.

Series XVII. Diseases of Blood-Vessels.

a. *Illustrations of Inflammation.*

580. A portion of mesentery and intestine, in an inflamed state, injected to show increased vascularity.

581. The ears of a rabbit, the smaller of which was in its natural condition, the other in a state of inflammation, at the time of the death of the animal, in consequence of which it is more vascular, and in some degree thicker in its coats. [This state of the ear was induced by the act of freezing, in an experiment on the power of producing heat in animals, in the year 1777.]

582. The head of a cock, into the comb of which two small spurs have been transplanted. Firm union has taken place, but very little extent of growth, before the death of the animal.

583. The head of a cock, into the comb of which a spur, apparently from another fowl, has been transplanted. [The spur has acquired a most unusual size, and curling obliquely forwards, has separated into two nearly equal portions, that diverge from each other. They seem to have been occasionally cut shorter, to prevent the destruction of the bird by pressure on its neck, and also to allow it to feed, as it could not otherwise have reached the ground with its bill. Each portion is, at the least, six or eight times the size of the spurs on the legs of the bird. The legs are also preserved, on account of the morbid appearances they present, in a considerable enlargement about the joints, by ossific deposit; and the disposition they express for the formation of horny substance externally.]

584. The metatarsal bones of two cocks, on which were transplanted the spurs of hens. [A large addition of ossific deposit has taken place in each instance, in consequence of inflammation, which was probably excited by the operation.]

b. *Ascites.*

585. A large cyst, from the left ovarium of Sarah Kippus, a widow, aged 55, of the parish of St. Mary, Norwich.

[An account of this extraordinary case of dropsy of the ovarium, by Philip Meadows Martineau, one of the Surgeons to the Norfolk and Norwich Hospital, is printed in the Philosophical Transactions of the Royal Society of London, for the year 1784, vol. lxxiv. page 471; and thence was copied into most of the medical and other periodical publications of that time. The following is a very brief abstract:

"The complaint originated after a miscarriage of her first child; at the age of twenty-seven. From the year 1757 to August 1783, when she died, she had eighty times undergone the operation of tapping; and, in all, had taken from her 6631 pints of fluid, or upwards of thirteen hogsheads. One hundred and eight pints was the largest quantity ever taken away at one time; she was never tapped more than five times in any one year; and the largest quantity in a year was four hundred and ninety-five pints. The most fluid collected in the shortest space of time, was ninety pints in seven weeks, from July 24, to Sept. 10, 1780; which is very nearly two pints a day.

"On the 10th of August 1783, the poor woman died. On the following day, on opening the body, seventy-eight pints of clear fluid were drawn off: supposing therefore all the fluid to have been taken at the last operation, then in three weeks she had collected seventy-eight pints, which is more than three pints and a half each day; a quantity far exceeding what she had taken. The disease was situated in the left ovarium. The sac, during life, once held one hundred and eight pints, but I could not after death make it contain more than fifty. The sac is in the collection of John Hunter, Esq."

c. *Diseases of Veins.*

586. A portion of the jugular vein of an ass, that had been bled several times. The coats are varicous, or dilated into a kind of aneurismal sacculi in several places.

587. A similar preparation.

588. The blood-vessels of a testicle become varicous, and which from their pressure had destroyed [or produced absorption of] the substance of the testicle. The vessels are injected.

589. Small spherical bony tubercles from the peritonæal veins.

d. *Diseases of the Heart.*

590. A heart, in a natural or healthy state, injected. Used by Mr. Hunter for comparison with the diseased specimens.

591. A heart, injected. It is very much enlarged, particularly the auricles ; the blood-vessels remaining nearly of their natural size.

e. *Diseases of Arteries. Aneurism.*

592. A left arm, injected and dissected. The axillary artery is obliterated, and the brachial artery is smaller than natural at its commencement; but the sub-scapular artery, and the branch which inosculates under the acromion with the supra-scapular artery, are very large. The vessels have been filled with injection from below.

593. The superior portion of an aorta, irregularly dilated and ossified. The individual to whom it belonged had an aneurism in each poplitæal artery.

594. The continuation of the preceding aorta into the iliacs ; also irregular, and spotted with ossifications.

595. The arch of an aorta irregularly dilated, and spotted with ossifications ; particularly near its origin.

596. The arch of an aorta considerably enlarged, and almost entirely composed of osseous matter. The common trunk of the right carotid and subclavian arteries is also very much dilated.

597. An aneurismal enlargement of the arch of an aorta, and a considerable aneurismal sac communicating with it, by a very regular circular opening with a smooth edge. This sac pressed upon the cartilages of three ribs of the right side, and had produced the almost total absorption of the middle one. All the cartilages had previously become ossified, and the sac had begun to protrude externally between two of them.

598. An aneurism of the arch of an aorta. On its anterior side it has dilated

into a considerable sac, which has pressed upon, and almost destroyed, a large part of the first and second rib on the left side; and also a part of the first bone of the sternum, which is included within its cavity.

599. A large aneurism of the arch of an aorta, which projected several inches beyond the ribs. It includes a part of the clavicle, the first bone of the sternum, and the first, second, and third ribs of the right side, whose texture has been almost entirely destroyed by the pressure of the blood contained within the aneurismal sac.

600. An aneurism of the arch of an aorta, projecting externally to a very considerable extent. The internal sac communicates with the external one, by a rounded opening through the first bone of the sternum, which is almost entirely destroyed; but the disease does not otherwise appear to have produced much injury to the ribs, or neighbouring parts.

601. A large aneurismal sac, formed in the dorsal and lumbar region of the aorta descendens. The bodies of the four lower dorsal and first lumbar vertebræ, as well as the 11th and 12th ribs on the left side, have been in a great measure destroyed by the pressure of the contents of the sac. [See No. 388. Pathological Preparation in Spirit, which is apparently that part of the aorta which has been removed from this specimen, showing the aperture by which the vessel communicated with the aneurismal sac.]

602. A section of a large aneurismal sac, which was formed in the upper part of the thigh. A bougie is placed in the upper orifice, and the lower is filled with injection. The femoral artery and vein are injected.

603. The femoral arteries of a man who died of aneurism in Saint George's Hospital.

604. A knee-joint with a poplitæal aneurism of a considerable size;—the arteries and veins of the surrounding parts are injected.

605. A knee-joint, from an individual on whom the operation for poplitæal aneurism had been performed with success.

606. A poplitæal aneurismal sac, from a man on whom Mr. Hunter operated in St. George's Hospital, in December 1785.

[This was the first successful case where the operation was performed according to Mr. Hunter's new method, for the cure of poplitæal aneurism, "by tying the vessel in the anterior part of the thigh, at some distance

from the diseased part, thereby to diminish the risk of hæmorrhage, and admit of the artery being more readily secured, should any such accident happen:—that the force of the circulation being thus taken from the aneurismal sac, the progress of the disease would be stopped: and he thought it probable, that if the parts were left to themselves, the sac with its contents might be absorbed, and the whole of the tumour be removed; which would render an opening into the sac unnecessary.

"The patient was a coachman, forty-five years of age:—the disease had first been perceived three years previous to his admission into the hospital, and had gradually increased during the whole of that period:—he recovered from the operation, and returned to his employment, but died from fever fifteen months afterwards. On examination, the cicatrix on the anterior part of the thigh was scarcely discernible: the ham had no appearance of tumour, and was, to the eye, exactly like that of the other limb; there was, however, a solid tumour perceptible to the touch, filling the hollow between the condyles.

"The femoral artery was impervious, from its giving off the arteria profunda as low as the part included in the ligature; and at that part there was an ossification for about an inch and a half along the course of the artery, of an oval form, the rim of which was solid, becoming thinner towards the centre, and not bony but ligamentous. Below this part the femoral artery was pervious down to the aneurismal sac, and contained blood, but did not communicate with the sac itself, having become impervious just at its entrance.

"What remained of the aneurismal sac was somewhat larger than a hen's egg, but more oblong, and a little flattened, extending along the artery for some way:—the sac was perfectly circumscribed, not having the smallest remains of the lower orifice into the poplitæal artery:—the sac contained a solid coagulum of blood which adhered to its internal surface; and appeared to be composed of concentric lamellæ uniform in colour and consistence. The poplitæal artery a little below the aneurismal sac was joined by a small branch very much contracted, which must have arisen from either the profunda or the trunk of the femoral artery. About two inches below the sac the poplitæal gave off, or divided into,

the tibiales. The profunda was of the usual size, but a good deal ossified for some length after leaving the femoral artery: the two tibials, where they go off from the poplitæal, were in the same state. The trunk of the femoral vein, where it passes along the tumour, must have been obliterated, for at this part it appeared to send off three equal-sized branches passing over different parts of the aneurismal sac:—these must have been dilated branches; none of them having the course which the trunk of the vein should have taken."

For a detailed account of this operation, and preparation, of which the above is a very abridged extract, see the "London Medical Journal," for 1786, Vol. vii. page 391. and Vol. viii. page 126 to 135, with a plate.—See also the "Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge," Vol. i. 8vo. 1793. p. 147 to 156.—Also "Principles of Surgery," by John Bell, 4to. Edinb. 1801. p. 320; and 367 to 385: "On the safety with which we operate on the fore part of the thigh." Mr. Bell adds,—"The Operation proposed by John Hunter is one of the most important improvements in modern surgery; and one which only a great Surgeon could invent."]

607. The sac of a small poplitæal aneurism; the artery injected.

Series XVIII. Diseases of the Lungs.

608. The lungs, injected with wax; many of the air-cells of which are very much enlarged.

Series XIX. Herniæ.

609. A lateral view of a scrotal hernia, in situ.

610. The sac of a congenital hernia, laid open.

611. A hernial sac, with the testicle in situ. The tunica vaginalis testis is laid open. The vas deferens is injected with mercury.

612. A hernial sac and tunica vaginalis, laid open.

Series XX. Diseases of the Urinary Organs.

613. A urinary bladder, with the ureters and kidneys injected. The ureters are exceedingly dilated; the pelves and infundibula are prodigiously enlarged, and the kidneys themselves appear to have almost entirely lost their natural structure.

614. A corroded cast, in wax, of a section of the bladder, and of the urethra, in which a stricture existed in the membranous part of that canal.

615. A corroded cast, in wax, of a urethra, in which a stricture existed in the membranous part; attended by ulceration, and fistulæ in perinæo.

Series XXI. Miscellanea.

616. A portion of the intestine of a hog, the peritonæal coat of which is in several places covered with, or raised into, small pellucid cysts containing air: an appearance very frequently observable on the intestines of hogs that are killed in the summer months. [See No. 500. Pathological Preparation in Spirit:—another portion of the same intestine.]

617. The cyst of a large incysted tumour, from a sheep.

618. A similar preparation, [probably from the liver.]

619. Some minute hairs, an inch long, from a fistula which formed on the os coccygis.

620. The heart and large blood-vessels of an individual, whose spine was very much curved forwards; showing that the aorta and vena cava are adapted to the distorted state of the spine, so as to retain nearly their original relative situations. [This specimen is apparently from the same individual as the dry Pathological Preparation No. 159.]

Series XXII. Casts in Plaster.

621. A cast of the right arm of a man, in which existed an aneurismal varix, in consequence of the artery having been wounded through the vein, in the operation of phlebotomy.

622. A cast, also from part of the right arm, in an analogous case of aneurismal varix.

623. A cast of a deformed female pelvis, in which the superior aperture is reduced to one inch between the sacrum and the pubis.

624. A cast of a female pelvis much deformed in consequence of being affected with mollities ossium. The bones of the pubis are compressed together, and project forwards, by which means the acetabulæ present themselves in front of the pelvis.

625. A cast of a human uterus, "which had arrived at the full period of gestation: and on the patient accidentally falling, her labour pains came on, and before she could be delivered the uterus burst, and the child's arm made its escape out of the uterus, but did not pierce the peritonæum, at the part where it is reflected over the side of the bladder, uterus, and inside of the pelvis." [See No. 979. Pathological Preparation in Spirit: —the portion of the uterus in which the laceration took place.]

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